1. There are still minor typos, which I'm sure you'll catch in later iterations (e.g., "An examples of") along with text overflowing into the margins, so I'll keep my comments higher level.

Definitely fixed the problem of text overflowing. Have done a couple more readings since, so hopefully a lot less typos now.

2. It is pretty typical to have a chapter by chapter overview. I know Sec 1.6 follows your chapter outline, but it might be good to also have a short section with a thesis overview of the chapters. (Maybe.)

Good point – see new Intro chapter, it has a thesis overview of chapters.

3. For the first chapter, it is generally a good idea to make it as accessible as possible---so this means focusing more on the broad concepts that come into play and toning down the jargon. You should only really introduce concepts that are critical to understanding the context, significance, and contribution of your thesis. All the other details are generally left for the body of the thesis. Hence, thesis introductions are often relatively brief. I like theses that are very conceptual in the introduction and very crisp in the statement of the contributions, keeping it accessible to a broad engineering audience. Then the concluding chapter can be very precise in summarizing how the body chapters proved or supported the claims outlined in the introduction.

I thought about this some more, and I agree with you. Many previous theses from our lab do a lot of literature review in the introduction, resulting in an intro that is hard for an interested reader to pick up and figure out what the main contributions are. I’ve rewritten the Intro chapter to be a lot shorter and focus on high level details about the state of the art and my contributions, and left a lot of details to the actual chapters. The intro should now be readable for an undergraduate engineering student. I did keep in the “global” variables for the friction circle figure, just because they are pretty important for and unchanging throughout the thesis.

4. Fig. 2.1b, it wasn't entirely clear to me how you determine the points between the (s, k(s)) coordinates.

This was indeed confusing – I have removed the asterisks to avoid confusing the coordinates as knot points for a spline.

5. In the conclusion sections of your chapters, it would be good to quickly summarize the significance of what you did and how you advanced the state of the art.

Good suggestion – added several sentences in each chapter conclusion summarizing the significance of the contribution

6. Ch. 3. It might be good to discuss the relationship of your approach to optimization using two sequential subproblems. Your thesis does a good job of summarizing past work on similar applications, but I think relating your general approach to prior work on a theoretical level could be improved. Some of the relevant prior work might not be directly applied to driving.

Good suggestion – I have added a few sentences and references in the Chapter 3 intro noting the inspiration from sequential convex programming and expectation/maximization.

7. It might be good to have a little more discussion on what is lost by using this iterative approach to optimization. Can you construct a pathological case where this iterative approach fails badly?

This has been clarified in the Chapter 3 intro – because I am taking a nonlinear control problem and approximating it’s solution with convex two sub-problems, the guarantee of a globally optimal solution is lost – so any situation where the initial guess is poor will likely result in a bad output. This is the same drawback with other sequential algorithms – a bad initial condition will lead to a suboptimal answer.

8. In Sec. 3.2 it might be good to elaborate a little more about what exactly is the new insight you bring beyond what was done by the others that you cite.

I should have clarified this better – there is no new insight when it comes to finding the minimum time speed/acceleration profile given a fixed path. This part of the algorithm is a previously solved sub-problem, and there are many published methods for doing this – I just use a library written from one of the papers I cite. I have changed the text to make this clearer.

9. The nonlinear programming approaches can get stuck in local minima, right? Is it rare for that approach to end up with a terrible local solution? If it is not rare, then that might lend further support for your approach, right?

See response to point 7 – unfortunately, this method can get stuck in local minima as well. For my algorithm, naively initialize to the race course centerline. However, if the algorithm was initialized with an ill-formulated initial guess (think of the car swerving left and right the whole time), the resulting answer would probably not be good.

10. Sec. 3.4.3, you mention this later on (later in 3.4.4), but at this point in the discussion it is probably worth pointing out that the evaluation was done on the same model used for optimization, right? And this could lead to overestimating performance? It's fine to compare to a human driver, but it is probably good to mention the limitation of the comparison.

After looking closely at this section, I think it makes more sense to discuss the model limitation in 3.4.4, because this is where lap time estimates first come in. Section 3.4.3 is more a comparison of just the XY coordinates of the racing lines, which would make discussion of power limitations and other modeling assumptions more confusing.

11. Ch. 4, I was expecting to see more background on ILC---more references (not just driving references as you have in Sec. 4.1) and discussion of the context of your contribution.

I agree – since the Intro chapter now is a lot more concise, I added general background on ILC to the beginning of Chapter 4. It makes more sense to have that background here so a reader uninterested in this chapter doesn’t have to wade through a lot of background in Chapter 1.

12. Because of the way it was designed, Matlab is pretty terrible for the implementation of tree-based algorithms like A\*. A C++ implementation would be quite a bit faster. I'm not suggesting you reimplement it, but it might be worth noting that it could be sped up by a couple orders of magnitude.

Good point – I added sentences in Chapter 5 and Chapter 5 that noted the possible speed up of a C++ implementation.

13. The discussion of further work in Ch. 6 is very nice. However, there seems to be missing citations, e.g., to POMDPs.

Added in citations for several existing works on decision making under uncertainty for autonomous vehicles using POMDP’s in the discussion section of Chapter 5.

14. Ch. 6 should really contain a concrete summary of your contributions; ideally with backreferences to where you demonstrate those things.

Dr. Okamura suggested this as well. I have added a summary of contributions with backreferences at the beginning of Ch. 6. Like you said, since Chapter 1 is now more general, this summary of contributions is more specific.

15. It would be good to check the formatting of your references (e.g., capitalization).

I did a thorough check of the citations, making sure similar references are cited similarly, and keeping things consistent with regards to capitalization. Let me know if you still see any inconsistencies.